

Application No. 10/618,808  
Amendment "A" dated June 13, 2005  
Reply to Office Action mailed April 6, 2005

### REMARKS

Applicants and Applicants' attorney express appreciation to the Examiner for the courtesies extended during the recent interview held on June 6, 2005. Reconsideration and allowance for the above-identified application are now respectfully requested. Claims 1-28, 30-35, 37-48 and 50-73 are now pending, wherein claims 1, 2, 19, 21, 30, 31, 37, 50, 58 and 68 were amended, claims 29, 36 and 49 were cancelled, and new claims 71-73 were added by this amendment.

The Office Action includes a restriction requirement in which claims 2-30 and 32-36 of Group I, claims 37-52 of Group II, and claims 53-70 of Group III were deemed to be patentably distinct. Applicants hereby confirm the provisional election of claims 2-30 and 32-36 of Group I without traverse. Nevertheless, the Office Action also stated that original claims 1 and 31 were linking claims, and that if they were found to be allowable, the restriction requirement would be withdrawn and claims 37-70 of Groups II and III would be rejoined and allowed together with allowable claims 1-36. In order for claims 1 and 31 to remain as linking claims, method claims 37 and 50, respectively, were amended in like manner in order to be commensurate in scope with claims 1 and 31. In view of the further comments below regarding the patentability of claims 1-28 and 30-35, Applicants submit that claims 37-48 and 50-70 are suitable for rejoinder and request that they be allowed together with claims 1-28 and 30-35. New claims 71-73 are also believed to fall within the elected subject matter.

The Office Action rejects claims 1-36 as being alternatively anticipated by or obvious over Zhou et al. (US 6,168,775) and Zhou et al. (6,534,661). As discussed and agreed to during the Examiner Interview, neither Zhou '775 nor Zhou '661 teach or suggest the desirability of manufacturing a supported catalyst that includes catalyst particles anchored to a support by an anchoring material, "wherein at least about 50% of the anchoring material is straight-chained instead of branched". See Examiner Interview Summary Record. As discussed in the present application, manufacturing a supported catalyst using a control agent in which at least about 50% of the control agent molecules are straight chained instead of branched helps to ensure that the resulting supported catalyst particles include the desired controlled coordination structure (*i.e.*, "the catalytically reactive atoms being arranged so that at least about 50% of a top or outer surface layer of the catalytically reactive atoms have a nearest neighbor coordination number of 2"). Application, paragraphs [0089] – [0093]. Because the anchoring material is formed by

Application No. 10/618,808  
Amendment "A" dated June 13, 2005  
Reply to Office Action mailed April 6, 2005

removing a portion of the control agent to expose the desired coordination structure, it follows that the anchoring material likewise has essentially the same preponderance of straight-chained versus branched molecules as the control agent. One of the things that can affect whether a polymer or oligomer is straight-chained or branched is polymer length. In general, reducing polymer length reduces the tendency of polymer branching. Application, paragraphs [0094] -- [0095]. Moreover, once the desirability of selecting straight-chained versus branched control agent molecules has been recognized (*i.e.*, in view of the teachings of the present application), those of skill in the art can devise other ways to ensure that a control agent has a preponderance of straight-chained instead of branched molecules (*e.g.*, utilizing milder polymerization conditions to reduce the tendency of free radical rearrangements that might cause or promote branching).

In contrast to claim 1 as now amended, the Zhou patents are silent with respect to whether or not the disclosed catalysts include an anchoring material at all, let alone one "wherein at least about 50% of the anchoring material is straight-chained instead of branched". Moreover, this feature is not inherent in the teachings of the Zhou patents since they disclose a relatively broad range of molecular weights for the control agent polymer but do not teach or suggest the desirability of selecting a control agent in which at least about 50% of the control agent molecules are straight-chained. *See* Zhou '775, col. 6, lines 17-24; Zhou '661, col. 8, lines 23-28. In fact, the examples for making catalysts in the Zhou patents do not disclose a control agent having any particular molecular weight but rather ranges of molecular weights. *See* Zhou '775, col. 5, line 66 -- col. 6, line 63; Zhou '661, col. 7, line 63 -- col. 9, line 36. In view of the foregoing, Applicants submit that claim 1 as amended is novel and unobvious over the Zhou patents, either alone or in combination with any other art of record.

Claim 37 as originally filed recited a method that utilizes a control agent in which "at least about 50% of the control agent molecules are straight-chained". To further ensure that claim 37 is commensurate in scope with claim 1 as amended (and therefore suitable for rejoinder), claim 37 was further amended to recite the inherent feature that "at least about 50% of the anchoring agent is straight-chained instead of branched". Because this is an inherent feature in the claim as originally filed, Applicants believe that claim 37 was not narrowed by amendment but simply recites what was already inherent as filed. Applicants submit that Claim 37 is patentable over the Zhou references and requests rejoinder and allowance of this claim.

Application No. 10/618,808  
Amendment "A" dated June 13, 2005  
Reply to Office Action mailed April 6, 2005

Claim 31 was alternatively amended in order to recite a supported catalyst that includes reactive catalyst particles disposed on a support material, wherein the reactive catalyst particles comprise "a plurality of catalytically reactive atoms including at least one member selected from the group consisting of base transition metals, rare earth metals, and solid non-metals". As discussed and agreed to during the Examiner Interview, the Zhou patents neither teach nor suggest the manufacture of supported catalysts in which the supported catalyst particles include catalyst atoms other than noble metals. On this basis, Applicants submit that claim 31 as amended is patentable over the Zhou patents, either alone or in combination with any other art of record. Method claim 50 was similarly amended and is therefore suitable for rejoinder and allowance together with claim 31.

Applicants also request allowance of claims 2-28, 30, and 32-35 and 71, since they depend from claims that the Examiner agreed are in allowable condition, as well as the rejoinder of claims 37-48 and 50-70, as discussed above.

In response to the indefiniteness rejection on the grounds that certain claims were in improper Markush group format, Applicants have amended all such claims. Applicants therefore submit that the foregoing amendment and comments address every issue set forth in the Office Action.

Moreover, Applicants have added new independent claim 72 in order to claim an embodiment that the Examiner agreed is neither taught nor suggested by the Zhou patents. New claim 72 represents original dependent claim 8 rewritten in independent form to include every limitation of base claim 1 and intervening claim 7. In addition, it includes the corrected Markush group format requested by the Examiner. As stated in the Examiner Interview Summary Record, the Zhou patents do not appear to teach or suggest "that the support material and anchoring material form a condensation reaction product of corresponding functional groups of the support material and anchoring material". First, the Zhou patents do not teach or suggest that the disclosed supported catalysts include an anchoring material. Second, even if one were to argue that an anchoring material is inherent from the teachings of the Zhou patents, it is not apparent from the teachings of the Zhou patents that this anchoring material forms a chemical bond to the support, let alone "at least one condensation reaction product".

Zhou '775 discloses a single example of making a catalyst in which the support material used in that example is "carbon black". However, the type of carbon black is not specified. As

Application No. 10/618,808  
Amendment "A" dated June 13, 2005  
Reply to Office Action mailed April 6, 2005

indicated by the publicly available document attached at Exhibit A, "carbon black is inherently hydrophobic" (*i.e.*, does not include a significant quantity of hydrophilic groups on the surface), at least initially before being surface treated to have a desired functionality. Hence, the document at Exhibit A further discusses "carbon surface modification technology" that allows one "to make hydrophilic carbon black particles". Because Zhou '775 is silent as to the type of carbon black used in the single example of making a catalyst, it is not apparent from the teachings of Zhou '775 whether the carbon black used in the example included functional groups capable of forming condensation reaction products with the control agent. Moreover, the example in Zhou '775 does not specify precise reagent quantities and reaction conditions but merely includes ranges of such variables. In view of this, Applicants submit that claim 71 defines a feature that is not taught, inherent or obvious in light of the disclosure of Zhou '775.

Zhou '661 incorporates Zhou '775 by reference. *See* col. 3, line 59 – col. 4, line 12. In the lone example of manufacturing a supported catalyst, Zhou '661 does not disclose the amounts of reagents used nor the precise conditions used to manufacture the catalyst, but merely a range of molar ratios and reaction conditions. Col. 9, lines 16-36. As a result, Applicants submit that it is not apparent from the teachings of Zhou '661 whether or not the example necessarily yields a supported catalyst in which a portion of the control agent remains so as to become an anchoring material that forms a chemical bond to the support, let alone "at least one condensation reaction product".

In view of the foregoing, Applicants submit that the claims as amended are in allowable form. In the event that the Examiner finds any remaining impediment to a prompt allowance of this application which may be clarified through a telephone interview or that may be overcome by examiner amendment, the Examiner is requested to contact the undersigned attorney.

Dated this 13<sup>th</sup> day of June 2005.

Respectfully submitted,



JOHN M. GUYNN  
Registration No. 36,153  
WORKMAN NYDEGGER  
Attorneys for Applicant  
(801) 533-9800

JMG:mla  
KCS0000005471V001.DOC